THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 25. JUNE 19th, 1954 VOL. 66.

SOME OBSERVATIONS ON BOVINE HYPOMAGNESAEMIA

BY

J. S. S. INGLIS, MARY WEIPERS AND A. MARR

UNIVERSITY OF GLASGOW, VETERINARY SCHOOL

Bovine hypomagnesaemia is seen mainly in cattle grazing rapidly growing pastures in the months of April, May and June, particularly when these have been heavily dressed with nitrogenous fertilisers (Bartlett, Brown, Foot, Rowland, Allcroft & Parr, 1954). The condition is also seen during the late autumn and winter months in cattle kept continuously out of doors. White (1952) considers the proportion of the latter type to be increasing.

Allcroft & Green (1938) and Allcroft (1947) have reported a seasonal variation in the serum magnesium levels in out-wintered cattle, with a low level during the winter months from November to April, and a normal level during the summer. Allcroft (1947) made a detailed study of the correlation of the changes in serum magnesium with climatic conditions. He found that normal levels of serum magnesium occurred when the weather was open and that low values were associated with cold, wet, windy weather, when there was little sunshine, and he considered that this association was in the nature of cause and effect.

Barker (1948) has also reported a seasonal variation in serum magnesium, with a maximum level in September and a minimum in March.

The purpose of the present communication is to record certain field and experimental observations which may shed some light on the development and alleviation of winter hypomagnesaemia.

FIELD OBSERVATIONS

Communications from veterinary surgeons and from other sources have indicated that numerous cases of hypomagnesaemia occurred in suckling herds in the south-west of Scotland during the months of November and December, 1953. All those cases brought to our notice occurred in cattle which were continuously at pasture and which were not receiving supplementary feeding. A point of special interest is that the feeding of hay had been delayed on account of the abnormally mild weather conditions prevailing during these months. The following is a detailed account of one of the outbreaks.

The herd involved consisted of 22 cross-bred cows, suckling beef calves. Over a period of 14 days six cows had been found dead. No clinical signs had been noticed before death and there was no evidence of struggling (indeed, this was a general feature in these outbreaks). All these cases were negative to anthrax examination. After the death of the sixth cow the owner's own veterinary surgeon consulted the veterinary school, and this animal was examined *post mortem*. No gross pathological lesions were found and toxicological examinations were negative.

From the history and the negative *post-mortem* findings, it was considered possible that the cause of death was hypomagnesaemia. It was decided, therefore, to take blood samples from as many of the remaining cows as possible. The owner was warned that the handling necessary for sampling might precipitate tetany in some of the animals.

Eight of the remaining 16 animals were available for blood sampling. Seven were sampled without incident. The eighth cow was noticed to be slightly apprehensive, with staring eyes, and showing fine muscular tremors over the thighs and shoulders. Enquiry revealed that this animal had shown slight inco-ordination of gait when being driven in. When the neck rope was applied this animal went down and showed typical hypomagnesaemic tetany and convulsions. Treatment by the intravenous and subcutaneous administration of calcium borogluconate and magnesium sulphate was given by the owner's veterinary surgeon after the taking of a pre-treatment blood sample. The animal responded well and got to her feet in about 10 minutes. About an hour after treatment the cow appeared fairly normal. Three days later this cow showed further mild symptoms, was treated again, and subsequently remained normal.

The results of the blood analysis of the eight cows sampled are shown in Table I.

TABLE I

MG. PER 100 ML. SERUM

Cow number	Calcium	Magnesium	Inorganic phosphate
KG.73020 ...	11·80	0·94	5·60
KG.73027 ...	11·95	0·88	6·30
KG.73045 ...	10·25	0·88	6·20
KG.73046 ...	11·20	0·82	5·80
KG.73088 ...	11·50	1·27	5·20
KG.73091 ...	11·95	0·71	5·50
Roan cow ...	—	1·10	6·10
White cow (with tetany) ...	11·30	0·58	6·40

The results confirmed that this was an outbreak of hypomagnesaemia. It will be noted that the blood calcium and inorganic phosphate levels were normal, even in the cow showing tetany.

The pasture, when examined, was found to have been closely grazed, and the herbage was sparse. Analysis of the herbage showed that the magnesium and calcium contents were normal at 0·25 and 0·69 per cent. respectively on a dry matter basis ; protein content was somewhat low at 12·9 per cent. ; the fibre content was 18·7 per cent.

From the results of an experiment conducted at Glasgow University Veterinary Hospital, and reported below, it was considered that supplementary feeding with hay would probably result in the raising of the blood magnesium levels out of the danger zone. Consequently the feeding of hay at the rate of about 20 lb. per head per day was recommended. As an added safeguard, because of the heavy losses which had already occurred in the herd the feeding of concentrates, supplemented by the addition of the equivalent of 2 oz. MgO per day, was also advised. No further deaths occurred in the herd, and the results of analyses on blood samples taken five weeks later are shown in Table II.

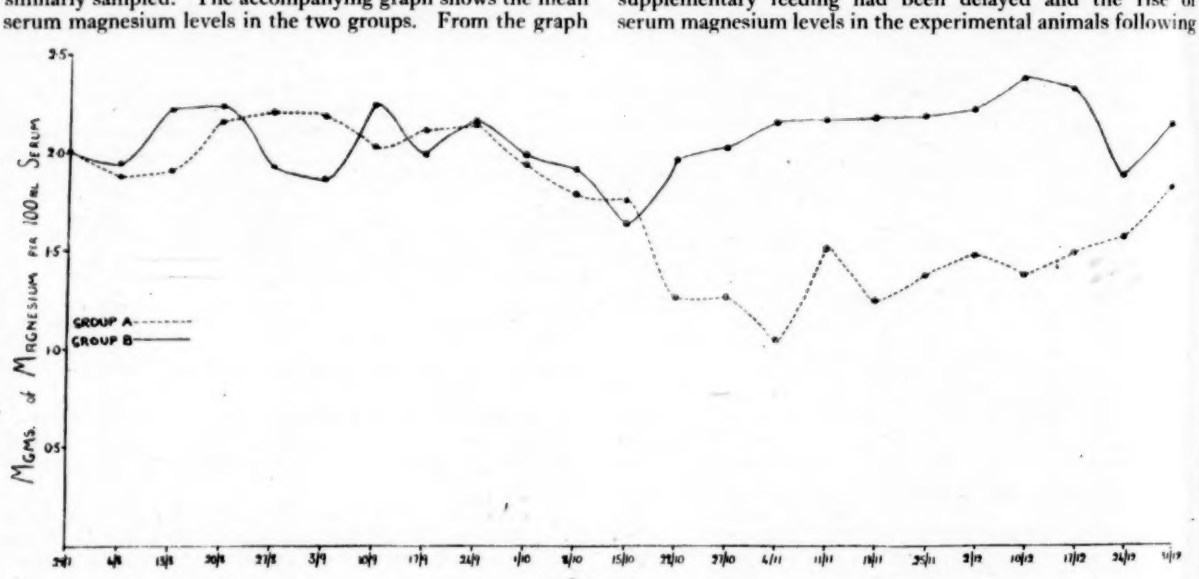
TABLE II
SERUM MAGNESIUM

Cow	KG. 73020	KG. 73027	KG. 73045	KG. 73046	KG. 73088	KG. 73005	Roan cow	White cow
Mg. per 100 ml.	1·68	1·95	1·89	1·27	1·78	2·10	1·37	0·90

It will be noted that, by the time of the second sampling, the magnesium levels had risen by approximately 80 per cent. All the animals, except the one which had previously had tetany, now showed levels of blood magnesium which are usually considered to be in the safe zone. (It will be seen that at the second sampling, cow number KG.73005 was inadvertently substituted for KG.73091.)

EXPERIMENTAL OBSERVATIONS

At the time of these field outbreaks, a marked fall in serum magnesium levels had been noticed in a group of four experimental cattle (Group A), kept out of doors at the Veterinary Hospital without supplementary feeding. These animals were being subjected to routine weekly blood sampling for estimation of serum magnesium levels. At the same time a group of four cattle (Group B), kept under indoor conditions and fed on hay and small amounts of concentrates, were being similarly sampled. The accompanying graph shows the mean serum magnesium levels in the two groups. From the graph



it will be noted that until mid-October the magnesium levels for the two groups were very similar, and statistical analysis (Student's t test) showed that there were no significant differences between the groups. From this date there was a sharp divergence in the serum magnesium levels of the groups, due mainly to the drop in Group A. By November 5th the mean magnesium level in this group had fallen to 1·05 mg. per cent. During this time Group B showed a slight increase in magnesium level and at November 5th was at 2·17 mg. per cent. The differences between groups were statistically significant. Hay feeding was commenced in Group A at the beginning of November, 7 lb. poor quality hay per head per day at first, changing to 16 lb. good hay per head per day on November 9th; feeding thereafter continued at this level. By November 11th the magnesium levels had reached the safe zone, and, apart from minor fluctuations, the levels showed a sustained upward trend and by December 31st had reached 1·85 mg. per cent. The rise in the magnesium levels in Group A following the feeding of hay was statistically highly significant.

The weather was exceptionally mild when the drop in the magnesium levels of Group A occurred and also during the initial period of the subsequent rise. The latter part of the rise took place when the weather was much colder. The pasture at this time had been closely grazed and the herbage was scanty. Analysis of the herbage showed the magnesium and calcium contents were 0·14 and 0·12 per cent. respectively on a dry matter basis; protein was 16·5 per cent. and the fibre 19·8 per cent.

DISCUSSION

The high incidence of hypomagnesaemia in out-wintered cattle in November and December, 1953, occurred when the weather was exceptionally mild. This would appear to be at variance with Allcroft's finding that hypomagnesaemia is associated with cold, wet, windy weather. Further, in the experimental animals at the Veterinary Hospital, the fall in magnesium levels took place during this period of mild weather, and the rise initiated by the supplementary feeding was maintained even when the weather worsened.

The high incidence of hypomagnesaemia in herds where supplementary feeding had been delayed and the rise of serum magnesium levels in the experimental animals following the feeding of hay, suggest that dietary factors are of critical importance. Support for this opinion can be obtained from the findings of Allcroft (1947) that during an exceptionally cold spell between December, 1939, and March, 1940, the feeding of additional hay and cabbage to his experimental animals resulted in a sharp and sustained rise in the serum magnesium; however, he attributed the rise in serum magnesium to a possible goitrogenic action of the cabbage which he regarded as being of more importance than the hay.

Our findings indicate that the feeding of hay is sufficient to counteract the downward trend in the magnesium levels of out-wintered cattle. It is, of course, probable that certain other foodstuffs would have the same effect. The effect of climate on serum magnesium would appear to be indirect and to act through its influence on nutrition.

CHRONIC FLUORINE POISONING ASSOCIATED WITH INDUSTRY*

BY

K. G. TOWERS

When agriculture and manufacturing plants are in close contact there is always a danger of the contamination of livestock foods with toxic materials. In Britain there is an extensive contact of this nature, for not only is there a country-wide distribution of industrial processes but the remnants of original agriculture persist even in such heavily industrialised areas as the coalfields. Serious trouble in the livestock population is, however, rare, for public health requirements and the conditions of the Alkali (Etc.) Works Acts necessitate close control of the worst dangers.

In the case of fluorine and its compounds serious contamination is of quite occasional occurrence, but losses which occur can vary from depressed productivity to actual loss of animal life. The total economic loss is small, in fact almost insignificant, when compared with the tremendous toll claimed by infectious and parasitic diseases ; but the effects of fluorine contamination may be severe locally, even if only a few farms, or a fairly small area are affected. Changes in farming routine, management and policy may be imposed, to the considerable financial disadvantage of the farm. This pressure may be so insidious that it is hardly realised by a farmer whose land is only just beginning to receive contamination, but when the owner is a newcomer and the deposit is heavy, then the consequences may be serious.

In Yorkshire the overall picture is not one of considerable and widespread loss, but rather of acute loss in the immediate vicinity of a source of contamination with symptoms tailing off fairly rapidly as one proceeds outwards. There may be a badly affected farm which is reduced to bankruptcy, and around this a zone where, by measures learnt from experience, the farmers can cope with the problem except when conditions increase the degree of contamination. On the periphery of such a circle there is a much bigger zone where low-grade symptoms are scarcely recognisable, but this zone may be of much more importance than is at present realised : the total loss in poor thriving, etc., may be very considerable. One may hear the story " we have bad luck with cows." The assessment of this loss is important but very difficult, for the interference with normal nutrition resulting from a small but continuous intake of an accumulative poison such as fluorine cannot easily be distinguished from other causes.

The Physiological and Toxic Action of Fluorine

If fluorine is an essential element for the animal body then exceedingly minute amounts are adequate, for experimental diets low in fluorine content have been generally successful in maintaining healthy growth. It is generally accepted that traces of fluorine have a marked action in preventing and arresting dental caries, and water supplies containing up to 0·5 p.p.m. are regarded as beneficial for human beings although levels exceeding 1 p.p.m. may be harmful.

The toxic action of fluorine and its compounds has been known for a long time, but attention in the 19th century was mainly directed to the occasional acute case of poisoning, quite often the result of either accidental or malicious administration of sodium fluoride intended for use as an insecticide. This interest in the acute case has been largely replaced by the recognition of more extensive poisoning from an intake at much lower level, which in the course of time gives rise to symptoms of chronic poisoning. The literature associated with this aspect is now extensive and frequent reviews have been published. Much early work, however, depended on analytical methods which have been superseded ; and due to the technical difficulties of precise estimations of very small amounts, the comparison of work performed at different times has to be made with caution.

When fluorine compounds are ingested by the animal body the acute toxicity of the substance is fairly closely related to its solubility. But in the low, continued intake associated with chronic poisoning, and especially in the ruminant, the physical properties of the ingested compound are less important. There is considerable absorption of relatively insoluble and refractory particles, when they are in small amount, in the alimentary tracts of sheep and cattle.

After absorption there is subsequent excretion of a considerable amount of the fluorine, principally by way of the kidneys, with elimination of smaller amounts in faeces and possibly horn and hair as well. That not excreted is retained principally in the bone and, to a lesser extent, in the teeth, the fluorine probably being present as a fluorapatite. The amount of fluorine present in bone increases in proportion to the amount and period of ingestion. When the intake of fluorine is stopped the observations of Blakemore *et al.* (1948) suggest that, in the case of cancellated bone, where metabolic activity would be expected to be greatest, a loss of 50 per cent. may occur in a period of six to eight months. In the bones of animals in apparent health there may be 12 or 15 times the low values found in the bones of animals not exposed to excessive amounts of fluorine.

It is clear, therefore, that the accumulation of fluorine depends on the balance between rate of absorption and rate of excretion. From individual variation in susceptibility to poisoning it would appear that there are individual differences in ability to excrete fluorine. It is reasonable to suppose that differing grazing habits between close neighbours are insufficient to cause widely differing intakes and hence different responses. Thus it is possible that a cow known to have been on a severely affected farm for 13 years, surviving the fluorine hazard and outlasting the deaths of other animals from poisoning, has survived without showing symptoms by its ability to excrete fluorine more rapidly than its contemporaries.

Experimentally, rats may show adaptation to fluorine absorption by developing a more efficient excretion. This may explain some of the individual variation in affected herds. There is a suggestion that certain families or strains may have an inherited susceptibility as shown by their poor performance under the hazard. The opposite, an inherited resistance, would be of value in mitigating the effects of contamination, but such resistance would not be easy to demonstrate, except over long periods of time and could not be absolute under conditions of excessive contamination.

* An address given to the Yorkshire Division on November 6th, 1953.

Acknowledgments.—We wish to thank the Racecourse Totalisator Charity Trust for financing the experimental work recorded here, and local practising veterinary surgeons, particularly T. B. Fleming, Esq., for their co-operation.

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The Sources of Chronic Poisoning

Fluorine does not occur free in nature, but its compounds are widely distributed and are found in minerals such as cryolite, fluorspar, and certain rocks of volcanic origin. Traces occur in sea water, in some mineral springs, in the bones and teeth of animals, and also in some plant tissues. Recently there has been an increased interest in fluorine and its compounds, and its uses in refrigerant gases and insecticides could constitute a danger to human and animal health unless control is adequate.

Spontaneous poisoning with fluorine compounds is found in many parts of the world in association with the high fluorine content of rock phosphate deposits, volcanic soils and natural water supplies, especially mineral springs which may be relatively rich in fluorine. Thus " le darmous " occurs in sheep in Morocco and Tunis and " gaddur " occurs in sheep in Iceland after volcanic eruptions. The most serious outbreaks of fluorosis in Britain are of industrial origin resulting from the contamination of pastures by fluorine compounds emitted by industrial undertakings concerned with a wide variety of processes, such as the production of aluminium, iron and steel, bricks, the calcining of iron stone, the manufacture of superphosphate, and products from colour and enamel works. At least 28 industrial occupations of man have been associated with fluorine hazards but some of these are within towns and do not concern farm stock unless the factories are near enough to farm land to contaminate pasture.

The cases of poisoning detected in Yorkshire are chiefly in the vicinity of iron and steel works, more particularly those works making basic steel by the open hearth process where fluorspar (calcium fluoride) is used as a flux and where the furnace gases are copious. It has become apparent, however, that there are other industries emitting fluorine compounds, and this makes it difficult to define accurately the affected areas by analytical methods. In particular it has been pointed out (Mitchell & Edman, 1952) that even the fumes from coal-burning furnaces may contribute to this hazard of livestock since coals and their associated shales may contain fluorine in varying, but appreciable, amounts. The total amount of fluorine contributed by domestic fires must be considerable, but being diffuse it is not considered of importance. Works burning vast quantities of coal, especially if it is of inferior quality, containing the shale which surrounds the coal seam, must of necessity be somewhat under suspicion but no clear case has yet been demonstrated in Yorkshire. The importance of such works is more likely to lie in adding to the heavy contamination derived from other sources.

This has necessitated some revision of the original impression that in Yorkshire the poisoning was entirely connected with the use of fluorspar by the steel industry, and that there was a " point " source of contamination. However, it is probably true to regard the bulk of the symptoms as being derived from this source for in many places animals exist in apparent health in close proximity to heavy users of coal.

The Affected Areas

When heated to about 1,360° C. fluorspar melts and its name is derived from this property (*fluere* = to flow) since it is used so extensively as a flux. The steel industry in Yorkshire has furnaces where this property is utilised, and where large quantities of fluorspar are consumed, notably in Rotherham, Stocksbridge and Middlesbrough. Most attention has been paid to the first two areas which lie in South Yorkshire. At Middlesbrough the prevailing wind tends to carry effluent out to sea, and in any case the little farming there is will soon disappear with industrial expansion.

At Rotherham the area affected lies mainly to the north, south and east of a large steel works lying in a shallow valley. The sides of the valley and the area immediately on top are the worst affected, but nearly all the farms here lie in the municipal developmental area and in time may be expected to cease to function as farms. There are some 200 agricultural holdings in this region and the immediately neighbouring parishes, and it is likely that all where cattle are kept will be affected to some extent. The topography of the ground, the suggestion of smoke shadows on lee slopes where but little deposit occurs, possible extraneous sources of fluorine and difficulties in interpreting fluorine figures on single urine samples, have all contributed to an inability to define the affected area accurately. On the northern side open-cast coal mining has further upset established farming.

The exact nature of the fluorine compounds which are produced by industry and cause herbage contamination is not known. For some time it was assumed that a surface deposit of particulate matter settled on grass, but it is becoming evident that there is but fragmentary knowledge concerning the uptake of fluorine by plants, either through the root system or metabolised by absorption through the leaf. It is known that certain plants, the tea plant is one example, absorb fluorine selectively ; and the clinical observation that symptoms may be seen for the first time in farms towards the edge of the contaminated area, particularly after grazing pastures which have been restored and reseeded after open-cast coal mining, raises the question, " Do young plants take up more fluorine than older ones ? " The answer may be related to other factors and disturbances of management, but the possibility of an increased uptake of fluorine by plant tissue under certain conditions merits attention.

This Rotherham area has suffered a fluorosis hazard for many years, but it was only during the war and afterwards that the problem became acute.

At Stocksbridge the source of contamination is a factory in a valley. The prevailing wind drives the smoke straight at and up the steep north-westerly side of the valley which rises quite near to the works. This hillside is mainly farmed by shift workers in the factory, who run their holdings in their spare time with the aid of their families. Just like Rotherham there is a history of serious trouble dating from the war years. This district is relatively free from other sources of contamination and will be valuable for experimental observations.

Animals Affected and Symptoms Shown

Attention was first called to chronic fluorine poisoning at Rotherham by illness in dairy cattle particularly in the early summer. The condition in each area remains essentially a bovine one for sheep are not kept on any of the affected farms. The Rotherham farmers explain that sheep are difficult to manage for fencing wire corrodes completely in less than two years and trespassers exercising greyhounds and whippets render shepherding difficult. Since it is known from both experimentally and industrially induced poisoning that sheep are quite susceptible to fluorosis, a contributory factor may well have been the poor performance of the flock. Two horses kept on the farm worst affected were stiff and suffered from rheumatism. One had been on the farm for 16 years, being at grass most of the time and doing little work apart from annual potato rowing. On *post-mortem* examination the lower bones of the limbs were found to be considerably affected by deposits of new bone. This suggests horses may be somewhat resistant when compared with milking cows.

The most obvious symptom noted in cattle is lameness, which may be very severe. There is also loss of condition and this is probably most severe when the pain of the lameness is most intense. The lameness has a marked seasonal

incidence, recurring annually in June and July, and attacking practically all the animals on the badly affected farms. On others only odd cases are found. When apparently healthy milking cows are turned out to grass in early summer, after a winter spent in the cow-shed, the normal abdominal outline is lost in two to three weeks and the animal appears tucked up. There is also a drop in milk yield which on one farm was as much as one gallon daily per cow in spite of the fact that the herd was grazing luxuriant grass. This was in the third week of pasturing and on removal to uncontaminated pasture there was steady recovery, the yield coming half-way back to normal in four days. If animals continue to graze the affected pasture, lameness soon becomes evident—a "moving" lameness which at first is exhibited in one leg and then in another. It is quite possible for a cow to go out from the morning milking lame on one fore leg and come back in the afternoon lame on the other. Fore and hind legs are affected equally commonly and diagonal lameness is often noted. Frequently an animal showing slight lameness becomes suddenly most acutely lame on one leg so that an accidental or deliberate tap on the wall of the hoof will cause the whole leg to be held suspended and trembling for a minute or two. Treatment has little effect on such cases, which are believed to be due to a transverse fracture of the os pedis involving the articular surface. When healing is sufficient to arrest movement of the fragments of bone there is quite a sudden clinical improvement. Single fractured os pedis bones in a limb give rise to such symptoms as walking with abducted or with crossed limbs according to the digital bones affected. When housed such animals rest the injured limb in or on the edge of the manger for long periods at a time. One cow became most skilful in walking on the edges of grooves left by wheeled vehicles so that one claw was taking all the weight and the other was suspended over the groove. Affected animals given a short rest away from contamination will show clinical improvement in only a few weeks, but fractured bones take two or three months to unite so that walking becomes sound.

Extoses are developed principally on the mandible and the limb bones below knee and hock joints. Deposits of callus may also be found on the ribs where fractures have resulted from collisions with doorways and stall divisions and other forms of external violence.

In all the Yorkshire districts affected by fluorosis similar symptoms are found, but the most severe cases occur in the vicinity of Rotherham. The lame cows gradually improve on being kept inside, and by the end of summer most have been found to walk soundly. The history is repeated annually and there is a tendency for the same animals to be affected each year. Generally a cow has been on the farm for two grazing seasons before symptoms are noticed. If it can remain for four or five years in the affected area and remain normal then it may be unaffected by lameness for the rest of its life—but such cows are not common. Providing lameness is absent and appetite is maintained the milk yield is not very severely depressed ; but as soon as severe pain is experienced the milk yield drops steeply and feeding and rumination are affected so that loss of condition is marked.

There is little rearing of calves in the affected area since it has been known for a long time that this is not a satisfactory procedure. Many of the dairy cows are bought from distant markets, and as they come with well-formed teeth the lesions of dental fluorosis are not marked.

In winter housed cattle are found to exhibit a considerable amount of "paddling" of the feet, the weight of the body being continuously moved from one leg to the other. Quite frequently a leg will be picked up and shaken before being put to the floor again.

Post-mortem Examination

Gross lesions are confined to bones and teeth, no macroscopic changes having been observed in other tissues. Particularly with digital bones a calcification of tendinous and ligamentous attachments has been found and this change may well be associated with the exhibition of milder forms of lameness. The lesions are in the main similar to those of other cases of fluorosis which have been described.

Discussion

From a national viewpoint there is no doubt that the conflicting claims of steel production and the agriculture of such areas as described must be settled in favour of steel. It is unfair, however, to expect farmers handicapped by the condition to compete on equal terms with their more fortunate brethren. Some method of mitigating the effects, or of providing compensation is long overdue, though it is realised that the assessment of claims will present difficulties.

As regards alleviation of symptoms, farmers by experience have learnt that bringing their lame cattle into cow houses will give the best chance of recovery that is generally available. The ideal would be to take an affected animal out of the contaminated area entirely, but if this is impossible, then taking it inside and feeding foods which are low in fluorine is the next best thing. Bought concentrates are suitable, and even home-grown grain has a low fluorine content for the glumes protect the grain from contamination and they are removed in thrashing. Hay, on the other hand, may be high in fluorine content, as also may be kale whose considerable leaf area may assist the accumulation of heavy contamination. There is also a suggestion that mechanically it is difficult to dislodge the deposited compounds. Root crops such as swedes and mangolds are protected from surface deposition by their development under the soil. The giving of calcium phosphate supplement to dairy cows has been ineffective as either a prevention or a treatment for affected cases.

It was recommended some time ago that the worst affected farm should cease to keep cattle after the remaining animals in the herd had been destroyed for humanitarian reasons. The replacement of the cattle by pigs and poultry was suggested as each individual would have a shorter life on the farm. They do not utilise foods which are liable to heavy contamination and are therefore less liable to serious exposure to the danger. This would seem to be sound policy, for experimental and clinical observations suggest that the order of susceptibility in domestic animals might be sheep, calves, dairy cows, other bovines, pigs, horses and hens. This order may require revision as the result of comparison tests based on fluorine intake according to bodyweight and neglecting differences due to the usual management of these classes of animals on the farm.

On farms affected to a lesser extent the substitution of a "flying" for a self-contained herd may be sufficient to overcome the menace, though this specific advice for a fluorosed area is contrary to generally accepted principles. The bought-in animals have an unknown susceptibility, but providing they are reared outside the affected area they should arrive with only normal amounts of fluorine in their tissues. Bone storage of fluorine will then take some time before excessive amounts are achieved. Since it will take some time for an excessive amount of fluorine to develop in the bones, it should be possible to dispose of the stock before this stage is reached. It is known that this recommendation is not satisfactory on heavily affected farms, for clinical fluorosis may become evident well within 12 months of the arrival of a previously unexposed cow or heifer.

It should not be forgotten that the apparent increase of clinical symptoms during the war and post-war years may have been influenced by the greater dependence on home-grown food. The amounts of food brought in previously would act as a diluent to any contamination present. It is suspected by many of the farmers whose stock is affected by this chronic poisoning that industrial expansion and increased consumption of low-grade and pulverised coal are factors of greater importance.

Acknowledgment.—The thanks of the author are expressed to Dr. Green and Dr. Allcroft of the Veterinary Laboratory at Weybridge for their very considerable assistance, both in determining analytical values and in the subsequent interpretation of such data.

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General Discussion

Mr. Donaldson welcomed the talk on fluorosis especially when it was provided by a member of the Society. As far as he was aware he had not seen the condition around Huddersfield and he welcomed contributions from those who practised in contaminated areas.

Mr. Marshall congratulated the writer on his paper which dealt with a condition which, if not universally important, was certainly of very considerable importance to some owners as witnessed by the film they had been shown. Some of his clients near Stocksbridge had given up cattle and had commenced poultry keeping. He thought it was important to realise how slopes facing the source of contamination were dangerous even though some distance away, if they were in the direction of the prevailing wind. One farmer so situated had taken his pedigree dairy shorthorns to another farm as he could not cope with the failure to thrive which was experienced in summer grazing. In another instance he reported that apparently fit animals sold from an affected farm had been returned because the purchaser, after inspecting the abnormally worn teeth, thought that the animals were older than had been claimed. On still another farm the R.S.P.C.A. had contemplated a court case against the owner for neglect of his stock but the pitting and staining of teeth indicated that fluorosis was, at least, a contributory factor. Around Barnsley there was much open-cast coal working with considerable dust being blown about during the process. He had noticed trouble on farms neighbouring such workings at the time of greatest activity—not after the land had been reclaimed. The drivers of the earth-moving equipment wore wet handkerchiefs over their faces and the pastures were brown in colour until it rained. He thought that osteomalacia in gilts suckling litters might possibly be connected with the pigs' habit of ingesting soil when pasturing.

Mr. McWilliam said that he had four clients with pedigree herds on the south-west side of the valley at Stocksbridge. So far as he was aware they were not affected. On the opposing slope, however, it was a very different matter ; he knew only three existing dairy herds, other farms having turned away from cattle keeping. In Sheffield itself he had one farm where fluorosis had been found.

Dr. Sellers had seen the film several times and was always struck with the thought " why were such things allowed to happen ? " He was familiar with fluorosis around brick works but had been shocked by the degree of symptoms found in the region. No doubt guns would always come before butter, and some affected farms were in the development area of Rotherham. He enquired about the effect on human beings and asked if the difference in symptoms between Yorkshire and other areas of fluorosis was due to dosage, type of animal, or other factors concerned in the poisoning.

Mr. B. Sinclair enquired about the degree of symptoms shown in different summers according to the type of weather.

Mr. Marshall referred to the lesions found in teeth. If the animal had been moved from clean to contaminated, and back to clean land, it was possible that the first pair of incisors would be normal and the second pair stained and pitted.

Mr. Towers's Reply

Mr. Towers, in reply, said there was some suggestion that trouble had been first detected near open-cast coal sites after reclamation of the ground. He had other cases of confusion regarding the age of an animal on account of unusual wear of the teeth. There was no known involvement of man in the poisoning and he thought that the symptoms in cattle were dependent on the degree of poisoning produced. There was no knowledge of any other toxic element, in addition to fluorine, being involved in the trouble. Symptoms were undoubtedly worse in dry summers. Whether rain mechanically washed the herbage or produced a luxuriant growth which diluted the amount ingested he was not prepared to say.

REVIEW

[The Principles of Dairy Farming. By Kenneth Russell. Published by The Dairy Farmer (Books), Ltd., Lloyd's Chambers, Ipswich. Price 25s.]

Mr. Russell has attempted and, I believe, nearly succeeded in writing a book which is essentially the practical man's guide to the principles of dairy farming that the scientist is gradually establishing; and it is more besides, for it is full of the salt of that wisdom of experience which science has not yet sought to interpret. As a result it is a warm-hearted book and mostly extremely lucid and easy to read ; indeed, the author's meaning is only obscure when over-enthusiastic editing splits up his paragraphs with intrusive sub-titles. These are particularly annoying when they mask the importance of the sub-headings that the author himself occasionally uses (*e.g.*, pp. 58, 66, 181–182).

The book aims at covering a very wide field, and perhaps suffers a little in that space is allotted to topics such as the control of weeds in dredge crops grown for feed when more might have been said with advantage about the chances or problems of grazing such a crop, winter sown, for " early bite." Indeed, what might be called " dairy-crop husbandry " earns more attention than, say, breeding or control of disease in the animals themselves. This, in turn, leads to some anomalies in the order of presentation. Following, for instance, a discussion on self-sufficiency there is a chapter advocating grass as the cheapest food for the dairy herd. The enumeration of grass feeding techniques which might then have been linked in, does not in fact follow for a further four chapters. Even then Mr. Russell remains a little conservative about the utility of grass when one remembers the production that has been achieved by some of our better grassland farmers.

But these are mostly small points and should not obscure the positive wealth of information and pleasure to be had from Mr. Russell's book and its profuse illustrations.

CLINICAL COMMUNICATION

A PRELIMINARY REPORT OF CLINICAL OBSERVATIONS ON THE USE OF METHYLPENTYNE-OL IN DOGS

W. M. WADMAN TAYLOR
London, S.W.7

Methylpentyne-ol was used in the course of general practice over a period of approximately six months on a variety of dogs, ranging in age from five weeks upwards. This report is the result of purely clinical observation, and it is emphasised that no measurements, *e.g.*, of reflex action time, etc., were made and in no case was a control animal used.

Methylpentyne-ol is supplied in the form of capsules containing 250 mg. of convenient size for administration to dogs.

Dosage.—From the limited use of the drug the dose was computed to be approximately 1 × 250 mg. capsule per 10 lb. bodyweight.

Uses.—As a mild sedative, especially to reduce fear in a nervous subject. As a soporific in certain limited cases. It appears to enhance the desire for sleep, but will not actually induce it unless the environment is conducive to sleep also. Methylpentyne-ol appears to have little or no analgesic effect.

Toxicity.—Doses of up to four times that stated above have been given, the only adverse effects being inco-ordination of the limbs, persistent yawning, periods of sleeping alternating with periods of inco-ordinated activity, and an effort to resist sleep.

A high proportion of dogs, particularly miniature poodles and miniature dachshunds, appear to be hypersensitive to the drug and small doses induce apparent dizziness. The dogs are unable to stand, and fall about in a most distressing fashion, strongly resisting sleep. This condition may last, in decreasing severity, for up to 24 hours. In the normal subject, a therapeutic dose loses its effect in approximately four to eight hours. In hypersensitive subjects the drug appears to take effect very rapidly. In the normal subject, signs of sedation can be expected in about 20 minutes.

Individual Case Reports

1. An adult cross-bred terrier bitch in advanced stages of pseudo-pregnancy, reported to be restless at night, frequently wandering about the house and obeying the nest-making impulse on various pieces of upholstered furniture. The treatment advised was 1 × 250 mg. at bedtime. Two days later the owner reported the bitch slept normally.

2. An adult cross-bred terrier of approximately 30 lb. During examination of a small skin tumour this dog was very nervous and struggled violently on the surgery table. It was not violently restrained and was allowed to remain standing, but it could not be pacified. It was given 2 × 250 mg. capsules and removed from the surgery. Two hours later it was led into the surgery, showing no fear or reluctance and was restrained on its side without difficulty while the growth was removed under local anaesthesia. This dog did not appear sleepy and there was no inco-ordination.

This case is typical of many.

3. A three-month-old miniature poodle, history of one fit of hysteria. This dog objected to being left without its owner and it was feared that leaving it might bring on hysteria. The owner was advised to give 2 × 250 mg. capsules half an hour before leaving the dog. The owner reported that five minutes after administration of the capsules the dog could not stand. On examination it was found to be in a very distressed condition, unable to hold up its head, showing marked inco-ordination of fore and hind limbs and extreme restlessness. This condition persisted for approximately 10 hours and decreased to normality over the next 12 to 14 hours.

Insufficient opportunities have been available to make it possible to form an opinion of the value of methylpentyne-ol as a pre-anaesthesia narcotic, but in the small number of cases in which it has been used, it has greatly reduced the amount of intravenous sodium pentobarbitone necessary to induce surgical anaesthesia. More information with regard to dosage is required ; a larger dose than that used to calm nervous subjects would appear to be desirable. Methylpentyne-ol may prove to be of considerable value in this respect owing to its rapid elimination as compared with sodium pentobarbitone. If, as appears to be the case, it greatly reduces the amount of sodium pentobarbitone necessary for anaesthesia, then it will reduce the prolonged recovery time associated with this anaesthetic.

The impression gained is that methylpentyne-ol is chiefly of value in allaying the fears of nervous dogs. Undoubtedly more information regarding dosage is necessary, but when the correct dose is used the drug does appear to calm the subject without producing any distressing inco-ordination. The temperamental, struggling toy dog becomes a more composed creature, showing little concern for strange surroundings or restraint.

The effect on the disposition of the subject would appear to be not an increase in courage, but a decrease in conception of the gravity of the situation. Circumstances which would normally produce fear and evasive action are apparently ignored. The attitude is one of peaceful indifference. Methylpentyne-ol might well be called the " pacific drug."

It has been observed in patients given a slightly larger dose than normal that the pedal, palpebral and light reflexes are slowed. There also appears to be a reduced response to sudden noise.

Summary

Methylpentyne-ol was used in canine practice as a sedative in a variety of cases and subjects.

It would appear to be a useful drug for the pacifying of nervous patients. In some cases it may be useful for helping to induce sleep. The probability is that it will prove to be of value in other circumstances, *e.g.*, as an adjunct to general anaesthesia. It does not appear to be analgesic.

Toxicity and danger from large overdose are apparently of small significance, but much more knowledge of the therapeutic dose range is necessary before the drug can be used to best advantage.

The drug is given by mouth in the form of soluble capsules. It is quick-acting and rapidly eliminated. It probably retards the metabolic rate and reduces reflex action time in large therapeutic doses.

Acknowledgment.—Methylpentyne-ol is produced and marketed under the name of " Oblivon " by Messrs. British Schering, Ltd., to whom acknowledgment is due for co-operation and supplies of the drug.

Erratum.—In the Review " The Mating and Whelping of Dogs " which appeared on June 5th, the words " choice of the dog " should, of course, have read " choice of the *day*." We regret the typographical error.

Professor James Basil Buxton, M.A., F.R.C.V.S., D.V.H.

Principal and Dean of the Royal Veterinary College

AN APPRECIATION

By the death of Professor J. B. Buxton, which occurred with tragic suddenness at his desk on May 25th, the veterinary profession in this country has lost a great man, who by his pioneer work in many spheres of activity made a unique contribution to its progress during the past 35 years.

James Basil Buxton was born in 1888, the son of James Buxton, M.R.C.V.S., who practised at Highgate. Educated at Highgate School and the Royal Veterinary College, he obtained his M.R.C.V.S. diploma in March, 1909, and then took the post-graduate course for the Diploma of Veterinary Hygiene in the University of Liverpool. He obtained this in the following year and ever after retained a lively appreciation of the course of instruction provided there. His first professional appointment came in 1911 as Lecturer in Hygiene at the Royal (Dick) Veterinary College. His tenure of this office was short, but he appears so to have impressed his students that he must have soon obtained high rank as a teacher had he continued in that capacity. It has always seemed a matter of regret that in his later years his administrative duties as Principal of the London College precluded his active participation in teaching.

In 1912 he was offered a most attractive post, the first of its kind in this country, that of Veterinary Superintendent of the Wellcome Physiological Research Laboratories then stationed at Brockwell Hall, Herne Hill, under the Directorship of Dr. H. H. (now Sir Henry) Dale who realised not only the need for expert care of serum-producing animals but also the great possibilities of research in the veterinary field. The choice was a fortunate one on both sides. It gave Buxton the inestimable advantage of working in close association with very distinguished men including, besides Dale himself, Glenny, Hartley, Henry and Südmersen, and they on their part were quick to appreciate his contribution to the more efficient running of the laboratories. He was given ample scope to develop his ideas and soon laid the foundations of a department which has such a fine record of achievement in veterinary research.

During the 1914–18 war he was one of the key men in organising the production of anti-gas gangrene and other sera which was called for on an enormous scale. In 1922, by which time he had firmly established his reputation in the profession, he joined the staff of the Medical Research Council and become Director of the Farm Laboratories at Mill Hill. There he took charge of the investigation into dog distemper undertaken by the Council with the aid of *The Field* Distemper Fund. The plans for this work, which were drawn up by him, and included all arrangements for breeding a supply of fully susceptible dogs to serve as experimental animals, laid the foundation of the success achieved by Laidlaw & Dunkin in their classical studies on the disease, a success which paved the way to the work on human influenza which was a natural sequel to it. Buxton's active participation in the distemper project was cut short by his being called to undertake a more important task elsewhere. He continued to act in a consultative capacity but it was typical of him that he claimed no credit for the outcome of the work.

The year 1923 was a notable one in the history of veterinary research in this country by reason of the endowment of a Chair of Animal Pathology at Cambridge and the establishment of a Research Institute in that subject with money made available through the Ministry of Agriculture. To the great satisfaction of the profession Buxton was appointed the first Professor and Director. Thus, for the third time in a, then, relatively short career he was charged with the duties of developing a research organisation. With his customary energy and powers of organisation he set about the task, and within a space of comparatively few years had built up a large Institute which became widely known throughout the world as a centre of veterinary research. This success was due in no small measure to the relations he maintained with his staff. He trusted them, gave them all they required to carry out their work, together with much helpful advice and encouragement. Under his direction the Institute became not only a centre of research but a training ground for research workers from home and overseas at a time when they were most badly needed.

Though Buxton made his main contribution to veterinary research in an organising, supervisory and advisory capacity—he was a member of many important committees—he liked nothing better than an opportunity to take his place at the bench, and he published a number of important papers. Among the subjects on which he worked were immunisation against tetanus, botulism, the double intradermal tuberculin test, the standardisation of tuberculin and caseous lymphadenitis and, with R.E. Glover, he was responsible for the large series of experiments on cattle carried out at Cambridge to assess the value of B.C.G. vaccine for the control of tuberculosis.

In 1936 he reached the culmination of his career when he was elected to succeed Sir Frederick Hobday as Principal of the Royal Veterinary College. His eminence and wide popularity in the profession, strong personality, great organising ability and thorough grasp of the requirements of veterinary education, of which he had given proof as Chairman of the Examination Committee of the Royal College of Veterinary Surgeons, marked him out as the obvious choice for the post. He assumed office at a time when the prospects of the College had never looked brighter. The fine new buildings at Camden Town, shortly to be opened by King George VI, were nearing completion, and it seemed that at long last funds were to be made available to staff, equip and maintain the College at a level commensurate with its importance to agriculture and to the community as a whole. The war soon came, however, and with it the necessity to evacuate from London.

The University of Reading, owing to a last minute change of plans, could only offer facilities for first and second year students, and alternative arrangements had to be made for the remainder. Here was a situation which called for all Buxton's courage, resource and powers of improvisation. At very short notice he set out to lease and equip extra accommodation so as to provide for the housing and teaching of students, and with the loyal help of his staff succeeded in re-starting the work of the College in January, 1940, after a lapse of only three months. Thus the College was enabled to carry on through the war the essential work of providing the profession with new graduates.

When the war had ended, and the teaching of the first four years had become fully re-established at Camden Town, the College sought admission to the University of London; and when this was granted nothing gave him greater satis-

faction than the recognition afforded to the senior members of his staff, of whom six were given the title of Professor and six, one of whom has since been promoted to an extra Chair, that of Reader. In addition he welcomed the arrangement whereby, as a School of the University, its financial provision took the form of a quinquennial grant, a much more satisfactory basis than heretofore. He had worked for a long time to secure a suitable site for a permanent Field Station. In spite of numerous delays and disappointments he always hoped it would shortly materialise, and he would have taken the greatest interest in the work of equipping it and getting it into running order.

Much of Buxton's work for the profession lay outside the range of his official duties. By 1918 he was already taking an active part in a movement to persuade the local societies to unite in forming a strong central body to promote the profession's interests. The object was achieved in 1919 when the National Veterinary Medical Association was launched on a new basis and took over the publication of The Veterinary Record. When John Malcolm died in 1920, Buxton was asked to succeed him as General Secretary and act as joint Editor of The Record. No praise can be too high for the manner in which he set himself, at this critical juncture, to get the organisation of the Association and its journal running smoothly, or for the energy, tact and resource whereby he achieved his object. He resigned three years later owing to the pressure of his ordinary duties, and received a special presentation for having " done so much to improve the advantages of the practitioner." When he became President of the Association in 1925 he made the most of the opportunity further to consolidate its position. He had been President of the Central Division in 1920 and later occupied that office in the Royal Counties and Eastern Counties Divisions as well as in the Veterinary Research Club of which he was a founder member.

For 34 years he served on the Council of the R.C.V.S., becoming President 1932–33 and Treasurer from 1948 to the time of his death. Throughout this long period his wide knowledge of affairs and shrewd judgment were of inestimable value to the profession both in the deliberations of the Council and its negotiations with outside bodies. One development in which he played a leading part is worthy of special mention. His concern for the improvement of veterinary education led him to advocate the extension, from four to five years, of the course of study for the M.R.C.V.S. Diploma. When this materialised he, as Chairman of the Examination Committee, did most of the work of planning the new curriculum, and also helped in many other ways to keep the standard of education abreast of the needs of the times. His influence in our governing body will be very greatly missed.

Throughout his life he was a zealous and untiring worker for the Victoria Veterinary Benevolent Fund, and of late years in the capacity first of Treasurer and then of President, took a large share in the difficult work of its administration. During the last year of his life it was his great privilege and pleasure to be Master of the Worshipful Company of Farriers.

His dignified yet genial manner, unfailing cheerfulness, keen sense of humour and generous disposition made him generally liked and respected. He was always careful to observe etiquette, and he hated unpunctuality. The many who sought his help found him a good friend and wise counsellor. He had a first-class brain, an almost instant grasp of a situation, and remarkable shrewdness in deciding how to meet it. These were the attributes which, allied to tenacity of purpose, great concentration and orderly method, enabled him to find time for his many activities and accounted for his phenomenally rapid rise, at a very early age, in the profession. His great organising ability lay in his capacity to decide on a course of action, and then to delegate work to others, in which he showed great judgment. This was never better exemplified than in the arrangements which he made as Honorary Secretary of the XIth International Veterinary Congress held in London in 1930 which created a great impression on all who attended and made the Congress the most memorable of the whole series.

He leaves behind him a record of service to the profession which few can hope to equal. He realised that its future depended upon its efficient organisation and the advancement of its research and education. To each of these ideals he contributed richly, and has set an example which long will be remembered.

He leaves a widow and two sons both of whom are members of the profession.

J. T. B.

ABSTRACTS

Displacement of the Bovine Abomasum*

In 31 of 33 cases recorded, the condition arose in late pregnancy or within two weeks following parturition. In the other two symptoms immediately followed *post-partum* paresis.

The abomasum in all cases had doubled upon itself and its greater curvature had slipped under the rumen and then dorsally between rumen and abdominal wall. In 11 cases the gravid uterus had descended under the rumen and caused this effect. The abomasum became enlarged by distension with gas and liquid ingesta.

Symptoms included sudden impaired appetite, scanty soft faeces, greatly reduced milk yield and rapid loss of condition. The temperature remained normal and the blood picture was unchanged. There was no pain on palpation.

Untreated cases become worthless because of emaciation. Twenty-one cases recovered following surgical treatment.

A laparotomy incision was made in the left sub-lumbar fossa, which exposed the pale, thin-walled abomasum. The latter was relieved of gas by needle puncture. The rumen, which was usually full, was incised, two-thirds of its contents removed, and then its wound closed.

Two 18-inch tape sutures were tied to the left rumen wall as low as possible. The abomasum was pushed under the rumen and the tapes pulled to rotate the rumen clockwise. The tapes were then released and as the rumen rotated to normal position it carried with it the abomasum.

The laparotomy wound was then sutured. After treatment consisted of administration of dextrose and antibiotic as indicated.

L. C. V.

* **Displacement of the Bovine Abomasum.** Moore, G. R., Riley, W. F., *et al.* (1954). *Vet. Med.* **49**. 49–51.

* * * * *

Spaying of the Cow*

This is a technique for the spaying of cattle by the use of elastic ligatures.

The operation is carried out with the cow in the standing position and usually without anaesthesia. It is preferable to fast the cow for 12 hours prior to operation. The rectum is emptied and the vagina douched. One hand is inserted into the rectum to grasp one ovary and bring it against the vaginal wall. The other hand, carrying the chain of a spaying

* **Spaying of the Cow, Endovaginal Ovarioptosis.** Fratta, I. D. (1953). *N. Amer. Vet.* **34**. 698–700.

écraseur, is inserted into the vagina to pick up the ovary in a pouch of vaginal wall. When the ovary has been firmly grasped in this way the chain of the écraseur is manoeuvred over the pouch and tightened sufficiently round its neck to hold the ovary firmly in this position. The ligature, consisting of a circular rubber band 0·2 cm. in diameter and 40 cm. circumference, is now stretched over the special noose support which is a metal rectangle with four prongs. This is carried over the écraseur into the vagina and over the pouch when by finger pressure the prongs fold down and release the rubber ring which tightens round the neck of the pouch. The écraseur may then be removed. The other ovary is then dealt with in the same way.

No special after care is needed other than comparative quiet. There are rarely any untoward effects.

The indications for the operation are, of course, the same as for any other method of spaying. The author mentions three cases of nymphomania in which removal of one diseased ovary by this method resulted in recovery and was followed by normal pregnancy and parturition. A case is also described in which this operation was applied to a case of vaginal prolapse and it is claimed that the degree of vaginal stricture resulting helped to prevent further protrusion.

It is claimed that this operation is simpler and safer than previously described methods. An objection would appear to be that this method is not applicable where the vaginal canal is too narrow to admit the hand and this would exclude many young fattening cattle.

J. A. L.

REPORT

Annual Report of the Department of Veterinary Services, Northern Rhodesia, for the year 1953

The aims of the department as set out in the report are broadly speaking: to maintain a high standard of animal health, to encourage improved methods of stock management, and to supervise and control the marketing of livestock and the preparation of animal products.

Clinical work on European-owned farms is imposing an ever-increasing strain on the time of veterinary officers and is causing an unfortunate lessening of the time available for very essential work among African stock owners.

However, until private practitioners come to settle in this rapidly-growing and potentially important stock-raising country Government veterinary officers must continue to perform these essential services.

But the first duties of the department are the control and prevention of animal epizootics and in this they are fortunate in not having to contend with diseases like rinderpest and East Coast fever, both of which are now absent.

The big problem during the year was the suppression of a widespread outbreak of foot-and-mouth disease, which disrupted the normal movements and marketing of stock. The virus type in this outbreak was S.A.T.1 against which the virus type S.A.T.2 of previous outbreaks had left no immunity. The new outbreaks proved highly virulent and necessitated the preventive inoculation of over 200,000 head of cattle. This campaign was still in progress at the end of the year.

Rabies continued to occur throughout the year, but the number of actual outbreaks was fewer than in 1952, an improvement probably attributable to the policy of compulsory vaccination which was started during the year in the large urban areas.

During the rains posterior paralysis again appeared among horses and two imported bulls also became infected and subsequently died. Although it was possible to demonstrate *Nuttallia equi* in the blood of infected horses it was found impossible to establish infection in laboratory animals. Intravenous injections of gonacrine proved successful as a treatment when given sufficiently early.

Trypanosomiasis occurred in several areas during the year and mortality was high. Observations on the benefits of antrycide as a prophylactic were continued. Where injections were given every two months protection was 100 per cent., but where the interval between injections was extended to four and a half months protection was less and parasites appeared in the blood stream. There has been no evidence of the development of drug fastness.

Streptothricosis, a skin condition of serious economic importance to the export trade in hides and skins, has failed to respond to experimental treatment with sodium iodide solution given intravenously at weekly intervals. Portable spraying apparatus, as developed at the Department's research station, using some of the newer parasiticides or fungicides, would appear to offer a greater chance of success and prove a more practicable form of attack.

Animal Husbandry

The Department has taken praiseworthy initiative in the sphere of animal husbandry. For far too long in African Colonies controversy and confusion have existed over the part to be played by Veterinary Departments in developing the economic productivity of the livestock industry. It is pleasing, therefore, to note that the Department of Northern Rhodesia is tackling the subject with energy and common sense. The department has wisely decided to bother no longer with stock improvement through extraneous breeds of cattle but to concentrate on developing the full potential qualities of indigenous stock.

Experiments have been commenced to determine the results from feeding different breeds of indigenous cattle on different planes of nutrition and to select through these feeding experiments the types likely to give the highest economic returns in terms of meat.

In efforts to meet the rapidly increasing needs of local markets for meat it is surely a sounder policy to increase the plane of nutrition of existing stock and bring them more quickly to slaughter condition than to spend money and time in trying to evolve a new type of animal which after all may have poor prospects of surviving under existing low standards of nutrition.

The results at present to hand of feeding experiments have demonstrated the benefits on a daily addition of 1 oz. of common salt to ordinary felt grazing and the more substantial benefits from a supplementary ration of 1½ lb. of ground nut meal per day and 1 oz. of salt. A gain of 0·82 lb. per day was achieved as against 0·62 per day in cattle on purely felt grazing.

In another experiment using cattle of three different African breeds and a high plane of nutrition it was found that animals of the Angoni breed gave a mean gain per day of 1·96 lb., whereas animals of the Afrikander breed on the same ration gave an increase in weight of only 1·44 lb.—a significant difference which if it can be repeated gives pride of place to the Angoni breed for beef production.

The special fattening of these animals on fodder crops specially grown should give local farmers a highly remunerative return and local markets an immediate source of increased meat supplies.

The Department of Veterinary Services has here a big field of practical usefulness which in its results should confute those who would advocate handing over all activities associated with animal husbandry to a separate department and leaving only the duties of disease control to veterinary departments.

The recent addition of a pasture research officer to the staff of the Department should prove of the greatest value in providing a higher plane of nutrition for livestock.

The efforts of Mr. J. H. N. Hobday, O.B.E., B.Sc., M.R.C.V.S., the Director, and his staff, in formulating and implementing a sound policy of livestock development will be followed with great interest and benefit.

W. W. H.

NOTES AND NEWS

Diary of Events

June 23rd.—Summer Meeting of the Royal Society of Medicine, Section of Comparative Medicine, at the Rothamsted Experimental Station, Harpenden, Herts, 10.45 a.m.

June 26th.—Joint Meeting of the Scottish Branch and the Scottish Metropolitan Division, B.V.A., in the Royal (Dick) School of Veterinary Studies, Edinburgh, 2.30 p.m.

July 14th.—Annual General Meeting of the Southern Region of the A.V.T. and R.W.s at the Royal Veterinary College Field Station, Streatley.

July 15th.—Annual General Meeting of the Northern Region of the A.V.T. and R.W.s at the Veterinary Science Division, Boot's Pure Drug Co. Ltd., The Priory, Thurgarton, Notts, 12 noon.

Sept. 19th—25th.—72nd Annual General Meeting and Congress of the British Veterinary Association at Torquay.

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JULY MEETINGS OF COUNCIL AND COMMITTEES, B.V.A.

Wednesday, July 21st, 1954:—

11.0 a.m. Organising Committee.
2.0 p.m. Home Appointments Committee.
3.30 p.m. Parliamentary and Public Relations Committee.
At 7, Mansfield Street, Portland Place, W.1.

Thursday, July 22nd, 1954:—

10.30 a.m. Veterinary State Medicine Committee.
1.45 p.m. Finance Sub-committee.
2.30 p.m. General Purposes and Finance Committee.
At 7, Mansfield Street, Portland Place, W.1.

Friday, July 23rd, 1954:—

10.30 a.m. Council Meeting.
At the Connaught Rooms, Great Queen Street, W.1.

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R.C.V.S. EXAMINATIONS

Thursday, June 24th.—M.R.C.V.S. Written Examinations.
Friday, June 25th.—Ditto.
Monday, June 28th.—M.R.C.V.S. Practical and Orals commence (Panels " A " and " B ").

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PERSONAL

Births.—KERR.—On June 10th, 1954, at 28, Corve Street, Ludlow, to Jill, wife of W. James Kerr, M.R.C.V.S., a sister for Seumas.

LLOYD.—On May 16th, 1954, at the Maternity Hospital, Cambridge, to Teresa, wife of J. R. Lloyd, M.R.C.V.S., D.V.S.M., a son —Owen John.

SACHS.—On June 5th, 1954, at St. James Hospital, Leeds, to Sheila, wife of Max Sachs, M.R.C.V.S., of 647, Scott Hall Road, Leeds, 7, a son.

Marriage.—PERRETT—REILLY.—At St. Mary's Church, Bitton, on May 18th, 1954, David Robert Perrett, M.R.C.V.S., only son of Mr. and Mrs. Perrett, of Meadow Farm, Bitten, Gloucestershire, to Maureen Valerie Reilly, daughter of Mr. and Mrs. Reilly, Hillcote, Chandler's Ford, Hampshire. Mr. R. T. Pepper, M.R.C.V.S., was best man.

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MEMORIAL SERVICE FOR PROFESSOR J. B. BUXTON

The memorial service for the late Professor J. B. Buxton will be held at the Church of St. Mary Woolnoth at 11.45 a.m. on Wednesday, June 23rd. Those attending the service are specially asked to arrive *not later than* 11.30 *a.m.*

The Church is at the corner of Lombard Street and King William Street, close to the entrance of the Bank Underground Station (Northern Line).

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Mr. Clement Elphick, M.R.C.V.S.

Mr. W. G. Blythman writes: The funeral of the late Clement Elphick took place at Newcastle Crematorium on June 4th. He qualified in 1905 at Liverpool and joined his father and three brothers in Newcastle upon Tyne.

They had an extensive practice in Northumberland and Durham, where his knowledge, particularly in relation to equine diseases and pit ponies, was unrivalled. For many years he acted as Veterinary Inspector to the county of Northumberland.

Clement Elphick was a staunch upholder of veterinary ethics and will long be remembered by those colleagues who sought his advice and guidance. He leaves behind him a widow, daughter and three sons, one of whom is a Veterinary Inspector of the Ministry of Agriculture.

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Captain J. W. Procter

Captain Procter, who died at his home on June 6th, was veterinary inspector to the York Corporation and veterinary surgeon to the Yorkshire Agricultural Society. He was also examiner and referee for the North of England under the Horse Breeding Act, and veterinary surgeon to the York Race Committee.

Captain Procter, who was commissioned in the R.A.V.C., had been a member of the Council of the Royal College of Veterinary Surgeons for 14 years.

His funeral, which took place at Holy Trinity Church, Micklegate, was attended by a very large and representative gathering from the civic, professional, agricultural and social communities.

He leaves a widow and two sons.

AN APPRECIATION

Mr. W. R. McKinna writes: It was with profound sorrow that we heard of the passing of John Procter, though we knew that he had been gravely ill for some months. In the North especially he was a well-known figure in veterinary and agricultural circles, a man with a great personality and possessing a wealth of experience which he was always willing to share.

His reputation as a veterinary surgeon, the former principal of a very extensive practice in and around York, will be well known, and his absence from the field of his former activities leaves a gap not easily filled.

Always an active member of the Yorkshire Veterinary Society, his opinions and guidance were invaluable in that sphere. He had filled the office of President with distinction, and last year he was one we were delighted to honour by the award of Honorary Membership. John Procter served on the Council of the Royal College of Veterinary Surgeons for many years, and I was privileged to serve with him for some years. I learned to know what a delightful companion he was and how burning was his zeal for the welfare of his profession. He would never compromise on what he held to be the basic requirements of professional ethical conduct and rendered very valuable service on the R.C.V.S. Council in this respect especially.

For his personal friendship I shall always be grateful, and what a delightful host he was. In his home there was always to be found a happy family atmosphere. To his wife and son, who have nursed him so courageously, we offer our deep sympathy and the hopes that the knowledge of the esteem and affection in which their dear one was held will be of some comfort in their great loss.

ACTING PRINCIPAL OF THE ROYAL VETERINARY COLLEGE

Following the death of Professor J. B. Buxton, late Principal and Dean of the Royal Veterinary College, Professor James McCunn, M.R.C.V.S., M.R.C.S., L.R.C.P., has been appointed Acting Principal.

Professor McCunn has been Professor of Veterinary Anatomy at the College since 1926. Following the admission of the College as a School of the University of London, the title of Professor of Veterinary Anatomy in the University of London was conferred upon him in 1950.

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CHAIRMAN-ELECT OF THE ROYAL SANITARY INSTITUTE

Mr. J. C. Morris, B.Sc., A.M.I.C.E., F.R.SAN.I., Borough Engineer and Surveyor for Willesden, has been appointed Chairman-Elect of the Council of the Royal Sanitary Institute. He will take up his new office in October.

Mr. Morris has been a member of the Royal Sanitary Institute since 1942 and was elected to its Council in 1948. He has been Recording Secretary of the Engineers' and Surveyors' Conference at the Annual Health Congress of the Royal Sanitary Institute for the past five years. He is also Chairman of the Congress Committee of the Institute and, in addition, serves on the Examination, Museum, Library and Education Committees.

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UFAW SUMMER SCHOOL

This Summer School will be held at Knuston Hall, Northamptonshire, from September 18th to 25th. During the week (at a date to be announced later) the annual meeting of the Veterinary Section will be held and the speaker will be Professor W. B. Beveridge, of Cambridge.

The programme will include expeditions to the Animal Health Trust Research Station at Huntingdon, to an artificial insemination centre and to Cambridge, etc., as well as lectures, discussions and social activities. The inclusive fee for the week, which includes full board and participation in all expeditions, is 5 guineas, reduced for students to 3 guineas.

Members of the profession, who are invited to attend if they wish, should apply for full details to Miss M. Williams, UFAW, 7a, Lamb's Conduit Passage, London, W.C.1 (Phone: CHAncery 9221).

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FOWL PEST SURVEY

The detailed results of the fowl pest survey undertaken by the Ministry of Agriculture in 1953 have now been considered by the Department in consultation with a committee of representatives of all branches of the poultry industry.

For the purposes of the survey several counties which had shown a heavy incidence of outbreaks were selected. One or two counties where there had been fewer outbreaks were also included. As a check one county was included where no outbreaks had occurred apart from a very limited number clearly associated with stock moved into the county.

The test employed—the H.I. test—had certain limitations, since it does not reveal the presence of virus but only the presence of antibody to the virus. It may not, therefore, give a positive result immediately after infection arises, though it will certainly remain positive for several months in birds which have apparently recovered from the effects of infection.

It was not possible in this survey to select accurately a particular representative sample of all types of flocks in a district or county. An effort was, however, made to select as far as practicable at random around 10 per cent. of all flocks in the district surveyed, and about 10 per cent. of adult birds in each flock were sampled. Occasionally flocks were included in the survey because, having regard to the history of fowl pest in the district, there might be some likelihood of latent infection.

During the survey visits were made to some 2,820 premises and about 51,000 birds were sampled from flocks amounting to nearly 580,000 birds belonging to general farmers, accredited breeders, commercial poultry keepers, domestic poultry keepers, smallholders and dealers. The proportions of premises on which reactors were found and of reacting birds were 2·16 per cent. and 0·88 per cent. respectively. On 10 of the premises on which reactor birds were found there was evidence of fresh stock having been introduced recently from dealers or markets. In a further 14 cases minor reaction was found in one reactor only among flocks of some size. Most of the premises on which reactor birds were found were revisited and resampled subsequently, but no positive evidence of infection was found on these occasions.

As most of the counties surveyed were selected because they had shown a high incidence of the disease, the results are accordingly weighted in this respect. The survey has, however, disclosed that there is no widespread latent infection and on this evidence the overall position is considered to be encouraging. The Ministry remains of the opinion that, given the full cooperation of all sections of the poultry industry, there is a reasonable prospect of the disease being eradicated. A committee of representatives of all branches of the poultry industry and the Poultry (Stock Improvement) Advisory Committee concur in this view.

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CONFERENCE ON DRAINAGE OF FARM BUILDINGS

At a recent conference on The Drainage of Farm Buildings, held under the auspices of the Berks A.E.C. at Agricultural Hall, Reading, three interesting subjects were discussed. They were: Pollution Problems Arising from Drainage of Farm Buildings; By-laws in Relation to Drainage of Farm Buildings, and Methods of Dealing with Drainage of Farm Buildings.

The first speaker, being the Chief River Purification Inspector of the Thames Conservancy, was particularly concerned with the prevention of contamination of the Thames, and therefore was more enthusiastic about adequate sewage disposal before it reached the Thames or its tributaries.

From the start there was clearly a great diversity of views by the experts on the proper methods of drainage. It was also clear that effluent disposal from farms was not a simple matter. The separate collection of urine from washing water was favoured, it being pointed out that whilst the installation was expensive it would pay for itself in terms of fertility in from five to seven years. The alternative method suggested was the absorption of excreta by putting down peat, lime or straw with the minimum use of water for hygienic purposes. Yet again another speaker favoured leading liquid effluent away to a segregated portion of the pasture and distribution into channels so that it soaked away.

It was clear that efforts to encourage farmers to improve farmstead hygiene, and the greater use of water to keep things fresh, had created a new hazard in that the excreta including the solid matter became diluted and made disposal more difficult.

The problem which the open collecting yard associated with the parlour system of milking had created was obvious. Excreta could be brushed up separately, but heavy rain was a serious hazard. As an alternative the advantages of a covered yard were advocated. Both urine and dung could be conserved with straw and removed from time to time. There was a strong division of views as to whether such yards should be drained.

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INTERNATIONAL COURSE OF FURTHER EDUCATION FOR VETERINARY SURGEONS

A course of further education for veterinarians will be held at the Veterinary College of Vienna III, Linke Bahngasse 11, from Thursday, September 9th, to Tuesday, September 14th, 1954.

The official welcome of delegates and the opening of the course will take place at the Veterinary College of Vienna on September 9th. The lectures will be held in the mornings and the afternoons will be kept free for visits to places of interest and for social functions.

As quoted in the prospectus, lectures with demonstrations and films will be as follows: The caesarean section in domestic ruminants; Observations on ovariotomy in carnivores; Dental caries in the dog; Enamel hypoplasia in animals; Recent findings on the development of animal parasites; Antibiotics and sulphonamides in cattle and swine practice; Brucellosis; Horse grip (equine infectious bronchitis and its sequels); The nervous form of canine distemper; Experiences on the therapeutical use of antibiotics; Tuberculosis of meat animals (actual problems of meat judgment); Recent advances in hormonal castration; Trichinosis and cysticer-

cosis; Vagus disturbances in the bovine; Distomatosis in man and domestic animals; The development of the animal cell as mechanism of protection and defence of the organism; Methods of vaginal examination in cattle; Special chapters on roentgen diagnosis and roentgen therapy; The veterinary surgeon and animal breeding; The Styrian fowl, the best suited breed for farm raising; The anatomical bases of nerve blocking in cattle; Hernias; Observations on lameness; Methods of eye examination; The veterinary surgeon and the protection of animals; Problems of forensic chemistry in veterinary medicine; Poisoning by feeding-stuffs.

Further information can be obtained from Professor Dr. J. Schrieber, Wien III, Linke Bahngasse 11, Anatomisches Institut der Tierärztlichen Hochschule.

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INTERNATIONAL CONFERENCE DISCUSS WARBLE FLY LOSSES

At a meeting of the International Hide and Allied Trades Improvement Society, held for the first time in Edinburgh on June 7th, a day was given up to discussion of damage caused by the warble fly, and of the attempts in various countries to eliminate it. Among the speakers were Professor A. Robertson (Junior Vice-President of the B.V.A.) and Mr. A. L. Wilson, Veterinary Investigation Officer to the West of Scotland Agricultural College.

In the course of discussion it was made known that in Denmark and Sweden warble damage had been reduced from 23 per cent. in 1922 to about 5 per cent. to-day. British experiments in the use of phenothiazine were criticised by some delegates, though others defended them, citing the fact that the damage to hides had been reduced. A paper submitted by the English Society observed that lack of supervision and failure to enforce fully the Warble Fly Order (about which a Parliamentary statement was quoted in the *Record* of May 29th) were factors to be reckoned with here.

In the course of his paper Mr. Wilson suggested that, with the derationing of meat and the consequent marketing of cattle by farmers, it seemed likely they would recognise their own interest in reducing the number of warbled hides. He thought an effective method of control would be a fairly large deduction for warbled hides. There was a precedent in the deductions made for stained fleeces.

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ROAD TOLL OF "PET" SHEEP

The Derbyshire Hill Farmers' Committee, concerned at the increasing number of sheep being killed on roads in the unfenced Derbyshire Peak district, blame holiday-makers who are making pets of the animals. Mr. Isaac Morten, the Committee Chairman, has said that some farmers lost seven lambs in a week.

"The sheep are being enticed to the roads by holiday-makers who pet them and give them titbits of food. We do not like to stop this tendency of visitors from the towns to make friends with animals, for it is a welcome change from reports of thoughtless cruelty. Unfortunately sheep are better left as wild animals, suspicious of human beings and nervous enough to avoid danger instinctively. Instead they are lining the moorland roads waiting for visitors to feed them."

In law, Mr. Morten points out, animals on unfenced pasture have right of way over the roads and precedence over motor vehicles.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Hunts.—Top Farm, Glatton (June 10).
Lancs.—Chadwicks Farm, Manchester Road, Westhoughton, Bolton (June 12).
Renfrew.—Knowes Farm, Johnstone (June 8).
Yorks.—Seal Houses, Arkengarthdale, Richmond (June 12).

ATROPHIC RHINITIS:

Bucks.—Cornerfield, Hollybush Lane, Denham (May 19).
Ches.—Lindow End Farm, Mobberley (June 3).
Fife.—Langlees, Oakley (June 1).

FOWL PEST:

Bucks.—The Marish Arms, Denham (June 6).
Essex.—Village Green Farm, Canvey Island (June 8).
Lancs.—Townsend Farm, Rufford Road, Mawdesley, Ormskirk (June 12).
Leics.—Crow Hill Farm, Wymeswold, Loughborough (June 9).
Norfolk.—The Folly, Hingham, Norwich (June 10); Largate, Horsehead, Norwich (June 12).
Middx.—Court View, Love Lane, Stanewell, Staines (June 6).

SWINE FEVER:

Bedford.—10, Bedford Road, Barton (June 12).
Ches.—Yew Tree Farm, Camberbach, Northwich; Moss Farm, Ollerton, Knutsford (June 12).
Denbighs.—Glan Aber, Bryn Glas, Rhos, Wrexham (June 9).
Essex.—Sunnyside, Risebridge Chase, Collier Row, Romford (June 10).
Glouc.—Broadclose Road, Down Hatherley (June 8); Michaelwood Lodge Farm, Charfield, Wotton-under-Edge (June 10).
Herts.—New Farm, Waddon, and White House Farm, Bassingbourn, Royston (June 7); Vellum Hall Farm, Church Lane, Northaw, Potters Bar; Gannock Farm, Sandon, Buntingford (June 10); Mobbs Hole Farm, Ashwell, Baldock (June 12).
Kent.—Glenora, The Common, Sissinghurst, Cranbrook; R.A.F. Station, West Malling, Maidstone (June 7); Piggeries, Maesmawr Road, Tatsfield, Westerham (June 12).
Lancs.—Elm House, Park Lane, Prescot (June 7); Plot 18, Y.M.C.A. Fields, Harefinch Road, St. Helens (June 8).
Lincs.—Whitehall Farm, Bigby, Barnetby (June 7); Walton Cottages, Westgate, Sleaford (June 10).
Monmouth.—Ty Pwll Holding, Hardwick, Abergavenny (June 8).
Norfolk.—R.A.F. Station, Marham, King's Lynn (June 7); Pit Farm, and Townsend Barn, Wereham, King's Lynn; 86, The Common, Itteringham, Norwich (June 8); Church Street, Falmingham, North Walsham; 4, Langham Road, Blakeney, Holt (June 10).
Notts.—Smallholding, Radcliffe Road, Gamston, Radcliffe-on-Trent (June 7); "Ivyholme," Main Street, Laneham, Retford (June 12).
Salop.—The Trench, Ellesmere; Somerwood Farm, Rodington (June 8); Rhydycwm, Beguildy; Park House, Park Hall, Whittington, Oswestry (June 9); Orchard House, Hanwood, Shrewsbury (June 12).
Somerset.—Bell Inn Farm, Buckland Dinham, St. Mary, Chard (June 9).
Surrey.—Brook Farm, Leigh (June 9); Woodham Park Nurseries, Woodham Park Road, West Byfleet (June 11).
Warwicks.—Holly Lane Piggeries, Erdington, Birmingham (June 12).
Worcs.—Little Winnall Farm, Ombersley (June 12).
Yorks.—Love Lane Allotments, Castleford (June 7); Beacon Rod Farm, Stannington, Sheffield (June 11); Green Syke Farm, Cowling, Keighley (June 12).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

R.C.V.S. COUNCIL ELECTION

Sir,—May I, through your columns, thank the Fellows and Members of the Royal College of Veterinary Surgeons for once again re-electing me as a member of their Council?

In a few weeks I shall have been qualified 40 years, and I must assure you that this does not infer that my outlook is B.C. —it is most decidedly A.D. I have trod the professional path by the hard way, and on looking back am glad that I did, because it has taught me to understand and to be sympathetic towards those who have followed.

Our profession should have no doubts about the future if it will only bear two fundamental conditions ever before it:—

1. Sink all petty likes and dislikes and resist any attempt from outside sources to weld it into a state machine, whereby that art of diagnosis—with no assistance from the patient (as in the medical profession)—will most certainly vanish.

2. Not to forget the opening verse of a poem by the late Sir Henry Newbolt:—

" There's a breathless hush in ' The Close ' to-night,
Ten to make and the match to win,
A bumping pitch and a blinding light,
An hour to play and the last man in;
It's not for the sake of a ribboned coat,
Or the selfish hope of a season's fame,
But the captain's hand, on his shoulder, smote
' Play up, play up, and play the game.' "

—Yours faithfully, J. F. D. Tutt, " Rothiemurchus," Winchester. *June 4th*, 1954.

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APPOINTMENTS IN NEW ZEALAND

Sir,—With reference to Mr. Dayus's letter in your May 1st issue, I cannot accept his statement that " the main roads in New Zealand compare favourably with their counterparts in this country" They are inferior, narrow and twisty, and even the main Auckland-Wellington highway is not tarred in its whole length, there being a long section which is just a " dirt " road. in the Northland, where I understand Mr. Toovey was stationed, the roads are atrocious, while in the South Island few of the main roads are tarred and the surfaces are very poor. The best main roads are in Wellington and Auckland provinces, but even they are indifferent when compared to British roads. The side roads are poor generally. While I was in New Zealand in 1951 I motored over the entire country, and I have vivid recollections of Mr. Dayus's comments on the main Gore-Queenstown road.

In 1952 I criticised the New Zealand Veterinary Club system in the *Record* on much the same lines as did Mr. Toovey, but from the viewpoint of an impartial observer. It cannot be denied that the Club Veterinary Surgeon is controlled by a committee of laymen and is known officially as their " employee "—an objectionable term for a professional man. At the annual Veterinary Conference in 1952 I heard much furious criticism by club veterinarians of the form of contract, which seemed to be very unpopular.

My considered opinion of the Club system was that it would have been excellent as a stepping stone to private practice, as is the Southern Rhodesian Club scheme. As a permanency it is unsuitable for the reasons given so plainly by Mr. Toovey. There is too much control of our profession generally in New Zealand by laymen.—Yours faithfully, J. L. Stewart, P.O. Magoebaskloof, North Transvaal, South Africa. *May 31st*, 1954.

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REPORT OF COUNCIL, R.C.V.S.

On page 2 of this Report it is recorded that a resolution to reduce the annual fee gradually to £2 2s. was defeated. It would be helpful if some of the pros and cons were given, and also the names of those voting, as this would be a guide to the election of members of Council.

Page 11 (4) refers to fees payable by members practising within the Republic of Ireland, but the amount payable is omitted. Why this omission?—Yours faithfully, J. Fox, 15, Thorncliffe Road, Wallasey. *May 31st*, 1954.

COLOURS OF HORSES

Sir,—In the Report of the Council of the Royal College of Veterinary Surgeons for the year ended March 31st, 1954, I see that a special committee has been set up to consider whether any revision or modification of the Council's report of 1930 on the " Preparation of a System of Description of Colours and Marking of Horses " is needed.

In the preface to the late R. B. Cunninghame Graham's " Horses of the Conquest," a book which every horse lover should have in his library, is given an abbreviated list of colours of horses met with in the Americas. This list includes bays, browns, blacks, chestnuts, piebalds, roans, greys, whites, cream coloured with black points, duns, skewbalds, claybanks, calicos, pintos, lobunos, grullos, zebrunos, pampas, picazos, malacaras, zainos, tordillos, doradillos, overos, barrosos, bayos, rosillos, etc.

How fortunate are the members of the R.C.V.S. Committee that the horses with which we deal in this country apparently do not present such a bewildering infinity of colours.—Yours faithfully, J. Barber-Lomax, Garsdale, Bury, Lancs. *June 8th*, 1954.

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EXPENSIVE DRUGS

Sir,—The timely warning given by the Minister of Health in regard to the cost of high-priced drugs both to manufacturers and doctors might well be applied to members of the veterinary profession. In this " atomic-cum-biotic " age drug firms have not been slow to boost every new discovery as it comes along, often before it has passed the experimental stage.

Looking back over the vista of years I recall entering into general practice armed with that descriptive masterpiece of therapeutics " The Action and Uses of Veterinary Medicine " by Finlay Dunn, which I then looked upon as my Bible. It was written in such a masterly style and with such conviction that one had only to follow the dictates of the context and, hey presto, the cure was assured.

Before many years had passed, however, I began to lose faith in the " alpha and omega " of drug therapy and rely more and more upon the " Vis Medicatrix Naturae," and I have never had any reason to regret this line of thought. The surgeon dealing with the physical body has to deliver the goods in an obvious manner; the physician belongs to another group, for here he is up against complex elementals, mental, psychological, and in man spiritual, by no means each in watertight compartments. Disturbance in one or all of these may lead in the ultimate to nemesis of the whole.

I am not depreciating the researches of the biochemist, or the enthusiasm of the therapist. On the contrary I uphold their activities gladly, but I do think the pendulum of biological and biochemical therapy has in these latter days swung round too far to the neglect, and at the expense of, the long-established basic remedies.

There is one other point which must not be lost sight of. We know much about the complexity of the animal body, yet how little is that compared with what we do not know. In the use, to saturation point, of antibiotics whose complexity is, to say the least, alarming, I fear there is a risk of saturating the animal body (the nature of which we know little) with specific agents of which, by reason of their complexity, we know less.

The most abused drug to-day, I venture to think, is penicillin, especially when applied to udder affections of the cow. No matter what the condition is, the owner demands a supply without first consulting his veterinary surgeon, for this agent has been so boosted by the lay press that owners now look upon it as the panacea for all mammary affections.

I think the time has now come when we as a profession should sound the clarion call, reminding the animal owner that Nature takes priority in the therapeutical rôle: it must be always remembered we practitioners are only her handmaidens in the healing field.—Yours faithfully, W. M. Scott, Fryern Hall, Bridgwater. *May 20th*, 1954.

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POULTRY HUSBANDRY

Sir,—It is frequently stated that the veterinary profession is as interested in controlling poultry diseases as it is those of other farm animals. But I see that the Association of Veterinary Teachers and Research Workers did not include poultry as one of their subjects in their recently held symposium on " The Place of Veterinary Science in Animal Husbandry."

Can it be that this Association, like some of those who take part in " What's My Line," consider that poultry are not " animals," or did they rightly feel that the subject of poultry husbandry would so prolong their deliberations that it would be better to deal with them adequately on another occasion? If the veterinary profession intends to expand its activities in the field of poultry diseases prevention and control it is vital that it discusses its rôle alongside that of its other patients.—Yours faithfully, W. P. Blount, Harkaway, Stoke Mandeville, Bucks. *June 10th*, 1954.